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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
KENICHI MOTOYAMA, ET AL. : EXAMINER: LOEWE  
SERIAL NO: 10/583,557 :  
FILED: JUNE 19, 2006 : GROUP ART UNIT: 1796  
FOR: WATER REPELLENT COATING :  
FILM HAVING LOW REFRACTIVE  
INDEX

REPLY BRIEF

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

The following is responsive to the Examiner's Answer dated September 4, 2009,  
concerning the above-identified application.

**Remarks/Arguments** begin on page 2 of this paper.

A critical issue in this case is the matter that the present process of preparing a coating fluid containing a polysiloxane is a non-aqueous process, which feature of the present process is also shared with the process disclosed in Nogami et al, but which feature is not shared with the process of Hayashi et al, whose reaction component (A) is produced in the presence of water as a reactant. In fact, the presence of water in the step of producing component (A) of the process of Hayashi et al is essential in order to conduct hydrolysis of the Si containing reactants thereby producing a polycondensed siloxane material that contains -Si-O-Si- bonds in the backbone of the polymer material produced. Thus, the polysiloxane material of Hayashi et al contains a high content of silica residues which is not a feature of the polymeric material of Nogami et al which does not contain silica residues. How then can the two disclosures be reasonably combined since the products obtained in the two patents are quite different compositionally.

The attempt at rejection is further confused by the Examiner's statement at page 5, lines 16-18 of the Answer regarding the Nogami et al patent that the reference *teaches preparing polysiloxane films which are prepared by hydrolysis with oxalic acid (an acid catalyst) without the addition of water*. This statement is clearly erroneous because oxalic acid, as a catalyst, alone can not hydrolyze any potentially hydrolysable material. Only the presence of water in a reaction medium permits the occurrence of a hydrolysis reaction. Only water can hydrolyze a hydrolysable material. Oxalic acid alone, without the presence of water, can not hydrolyze any material. Thus, the product film prepared by the process of Nogami et al, in which a fluid material is coated on a substrate and thereafter heated to cure the polysiloxane material, is distinct from the essentially silica material of Hayashi et al. As disclosed at column 3, lines 27-32 of Nogami et al, the film product of the patent has a low refractive index and good water repellency. On the other hand, Hayashi et al, although not disclosing the refractive indexes of products made by the process taught, nevertheless,

discloses silica based films which are structurally quite different from the polysiloxane films taught by Nogami et al and therefore can be expected to have different indexes of refraction.

Appellants refer to Example 1 of Nogami et al and Synthesis Example 1 of Hayashi et al for a demonstration of the differences between the procedure of Hayashi et al which features hydrolysis and Nogami et al where no hydrolysis of reactants occurs. In Nogami et al, an ethanolic solution of oxalic acid is first formed, and then tetraethoxysilane and tridecafluorooctyltrimethoxysilane were mixed are mixed into the ethanolic solution. The result of the reaction is a polysiloxane solution. In Syn Example 1 of Hayashi et al, a solution is formed mixing distilled ethanol, water and aqueous tetramethylammonium hydroxide. To this solution is added methyltrimethoxysilane and tetraethoxysilane. The solution obtained is warmed and the nitric acid is added. A significant amount of propylene glycol monopropyl ether is added. The resulting solution is concentrated in an evaporator at 50° C. The result is a high silica content product.

The Examiner maintains his position that the *substitution of compound (C) of the instant claims for aminopropyl(trimethoxy)silane as taught by Nogami et al would yield a functionally equivalent product*. Appellants do not agree with the Examiner's conclusion. It must be emphasized that a proper use of a combination of references (two here) is that the disclosures of the patents must suggest the scope of the present invention to one of skill in the art. Appellants do not agree that such a suggestion exists. Nogami et al teaches a reaction medium (nonaqueous) which may (not necessarily) contain a reaction modifier (E) in forming the desired polysiloxane, whereby the effect of the modifier is to lower the temperature for curing the coating on the substrate and improves the adhesion of the coating film to the substrate. A disclosed modifier is aminopropyltriethoxysilane. On the other hand, Hayashi et al discloses a polysiloxane product which contains significant amounts of silica units which are produced from a reaction medium that contains water as an essential component. The

reaction medium may (not necessarily) contain a silane coupling agent such as aminopropyltrimethoxysilane, ureidopropyltrimethoxysilane or ureidopropyltriethoxysilane for an unexpressed purpose, but may be to enhance bonding of a polysiloxane material to a substrate. However, in the present invention, as stated in the paragraph of pages 13 and 14 of the specification, if the ureido group containing silane component (C) is present in an amount of more than 0.20 mol per mol silicon compound (A), a coated film having a refractive index of 1.41 or less will not be obtained, and if it is present in the reaction medium in an amount less than 0.01 mol per mol of the of silicon compound (A), a film of adequate hardness will not be obtained. Since neither the Nogami et al patent nor the Hayashi et al patent teaches or suggests the specific effects achieved in the product produced by the present process by the presence of certain ureidoalkyl silanes in the present reaction medium, it is not clear how an attempted combination of the two patent disclosures would obviously lead one of skill in the art to the specific inclusion of a ureidoalkyltrialkoxysilane compound with reaction components (A) and (B) in the present invention in order to obtain the specific effects which are obtained upon the inclusion of the stated ureido group containing silane. Especially problematic is the application of Hayashi et al which discloses a product (containing substantial amounts of silica units) that is quite different from the polysiloxane produced by Nogami et al which does not contain silica units, as well as the product obtained by the present process which does not contain silica units.

Appellants remain of the opinion that the cited combination of patents does not suggest the invention and withdrawal of the rejection of the claims is requested.

Respectfully submitted,

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